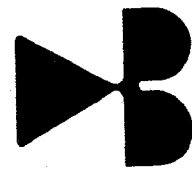


# **Burwen Dynamic Noise Filter**



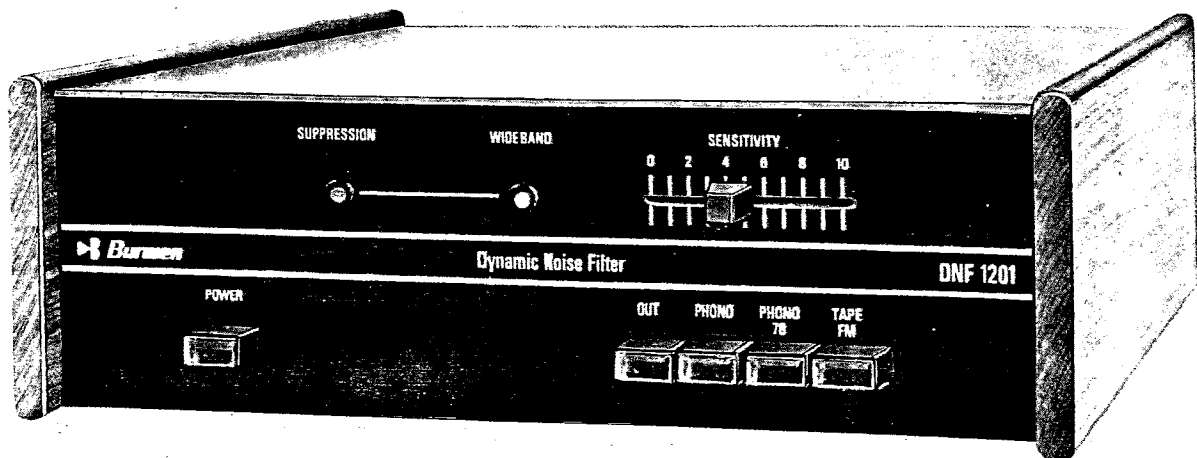
**Model DNF 1201**

# Burwen Dynamic Noise Filter

Substantially reduces noise from all high fidelity sources

Now you can enjoy music as you have never heard before. Just attach a Burwen DNF 1201 to your high fidelity system and listen to your receiver or tuner, your tape or turntable... you will be absolutely thrilled by the clarity and purity of your music. It is as simple as that, because a Burwen DNF 1201 reduces noise by as much as 14dB from any program source.

Add a new dimension to your sound enjoyment; that dimension is the ABSENCE OF NOISE. Burwen Laboratories, renowned for their noise reduction systems for radio stations and recording studios, now offers the same technology to the semi-professional and the high fidelity home user.



- 14 dB noise reduction
- Works on any program source
- Does not require pre-encoding
- Easy to use. Just plug into your system.
- Fully warranted.

# Dynamic Noise Filter

## Model DNF 1201 Specifications

Typical 25 degrees C with 5k load unless otherwise specified. Fully warranted one year parts and labor.

### CHANNELS

Two having matched frequency and phase response for stereo. May be used on quad matrix signals before decoding.

### HISS REDUCTION

6 to 14 dB for frequencies above 400 cps depending upon program material and control settings.

### FREQUENCY RESPONSE

Minimum Bandwidth

—3dB at 500 cps • —10 dB at 1 kc • —20 dB at 2.5 kc

Maximum Bandwidth

±.5 dB max. 10 cps to 20 kc

### HARMONIC DISTORTION

.2% max. 20 cps to 10 kc at 3V input, sensitivity max

### GAIN AT 1kc

0.0 dB, adjustable via rear panel controls

### INTERNAL NOISE

100  $\mu$ V rms, 20 cps to 20 kc

### INPUT

Level

.77V rms (0dBm) at 0 vu, 3V rms max  
Adjustable to 20 dB lower level

Impedance

50K

### OUTPUT

Level

.77V rms (0dBm) at 0 vu, 3V rms max

Impedance

50 ohms • Short-circuit protection included

### CONTROLS

push buttons— POWER, OUT, PHONO 78,  
TAPE-FM, slide pot — SENSITIVITY CONTROL

### POWER INPUT

115V  $\pm$  10% 50 to 60 cps, 8W 230V version available

### SIZE

11 $\frac{3}{8}$  inches long, 3 $\frac{3}{4}$  inches high, 8 $\frac{3}{8}$  inches deep

### CONNECTORS

6 phono pin jacks • Extra parallel input jacks for  
connection to tape deck



209 MIDDLESEX TURNPIKE, BURLINGTON, MASS. 01803 TEL. (617) 273-1488

# Model DNF 1201

## The Wizardry of DNF

The Burwen Dynamic Noise Filter constantly changes its bandwidth in accordance with the program material. By doing this we can eliminate unwanted noise and hiss without changing the tonal quality of the program material. The DNF 1201 works on any 2 channel or matrix encoded source and has a wide dynamic range equal to the finest high fidelity system.

## How to Connect your DNF 1201

The input to the Burwen DNF 1201 is connected to the record jacks on any receiver or pre-amplifier and its output is brought back on tape monitor jacks or auxiliary inputs. The input jacks are paralleled to an additional set so you can connect your tape or cassette recorder to these extra jacks.

## Easy to operate

Operation of the DNF 1201 is as simple as using your car radio. There are several push button controls to select the proper mode of noise reduction. The *Phono* position is for any 33 or 45 record played directly or recorded on FM; *Phono 78* is for 78 discs; *Tape/FM* is for cassette, reel-to-reel or cartridge tape FM broadcast, and highest fidelity records.

The *Sensitivity* control is a fine tuning control to make sure that you get the greatest clarity and noise free operation over the band width of the music. This control is set by listening to the original source with the *Out* button depressed and then inserting the filter. Adjust the sensitivity control to achieve maximum noise reduction without change in tonal quality.

## No pre-encoding required

Unlike other noise reduction systems such as Dolby, DBX or the Burwen professional audio processor, the DNF 1201 does not require that sources be pre-encoded. Therefore, it works on any source imaginable from microphones, discs, tapes, or broadcasts.

## Design

The DNF 1201 is designed with the highest quality integrated circuits and advanced analog computer technology available. You will be pleasantly surprised at how the DNF enhances your high fidelity system and allows you to truly hear for the first time noiseless passages of a symphony orchestra or the quiet voice of a single vocalist.

# **Burwen** LABORATORIES INSTRUCTION MANUAL FOR THE DYNAMIC NOISE FILTER

## MODEL 1201

### UNPACKING

Unpack your Dynamic Noise Filter carefully and check it for any possible damage caused by shipping. If the unit is faulty, return it in its original carton to your dealer since the shipping container may show evidence of mishandling. Complete your Instrument Warranty Registry Card and mail to Burwen Laboratories immediately.

### LINE VOLTAGE INPUT

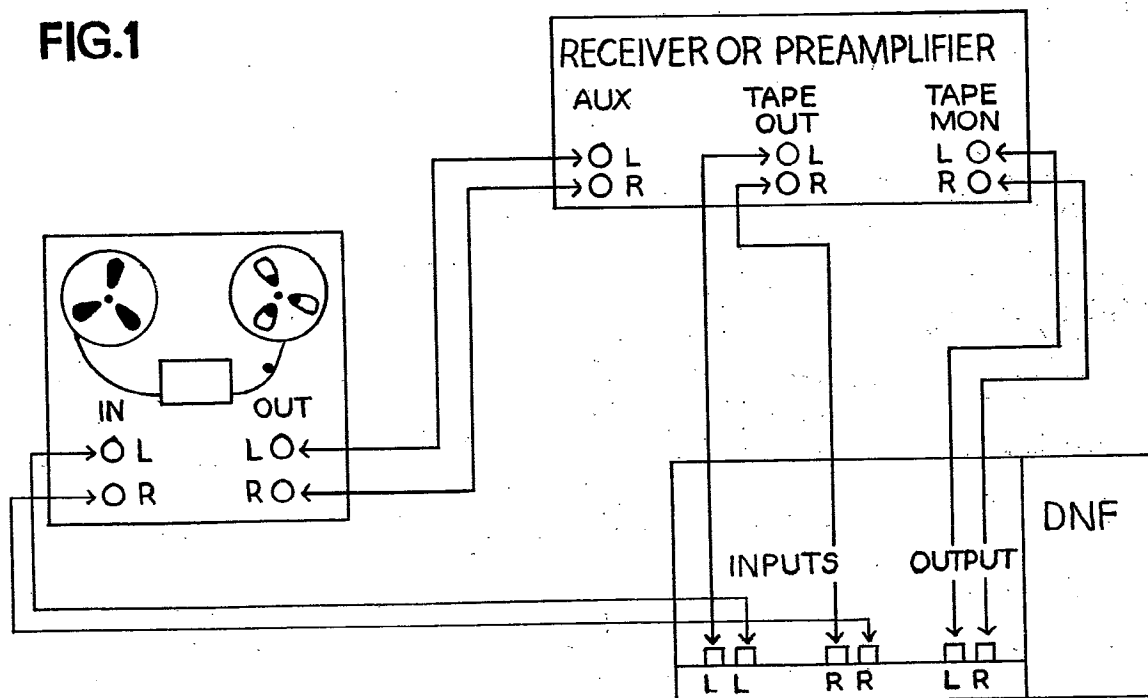
Your Dynamic Noise Filter is designed to operate with a power line input of 115 volts, 50 to 60 cycles per second (Hertz). Do not connect it to any other line voltage or frequency since this can cause damage to the built-in power supply. A 230-volt version is available on special order.

### INSTALLATION

Your Dynamic Noise Filter (DNF) is designed to suppress noise for any stereo or matrix 4-channel high-fidelity system. Since the DNF will remove noise from all program sources, it should be connected to that part of your system through which all programs must pass.

NORMAL CONNECTION (applies to most receivers and preamplifiers with a single tape monitor: refer to Figure 1.).

- 1.) Disconnect power from your system.
- 2.) Connect the INPUTS of the DNF to the TAPE OUT jacks of your system.
- 3.) Connect the OUTPUTS of the DNF to the TAPE MON input jacks of your system.
- 4.) Connect the inputs of your tape deck to the spare set of INPUT jacks provided on the DNF.
- 5.) Connect the OUTPUTS of your tape deck to AUXILIARY inputs of your system.
- 6.) Operate the TAPE MON switch to insert the DNF between the source and the rest of your system.

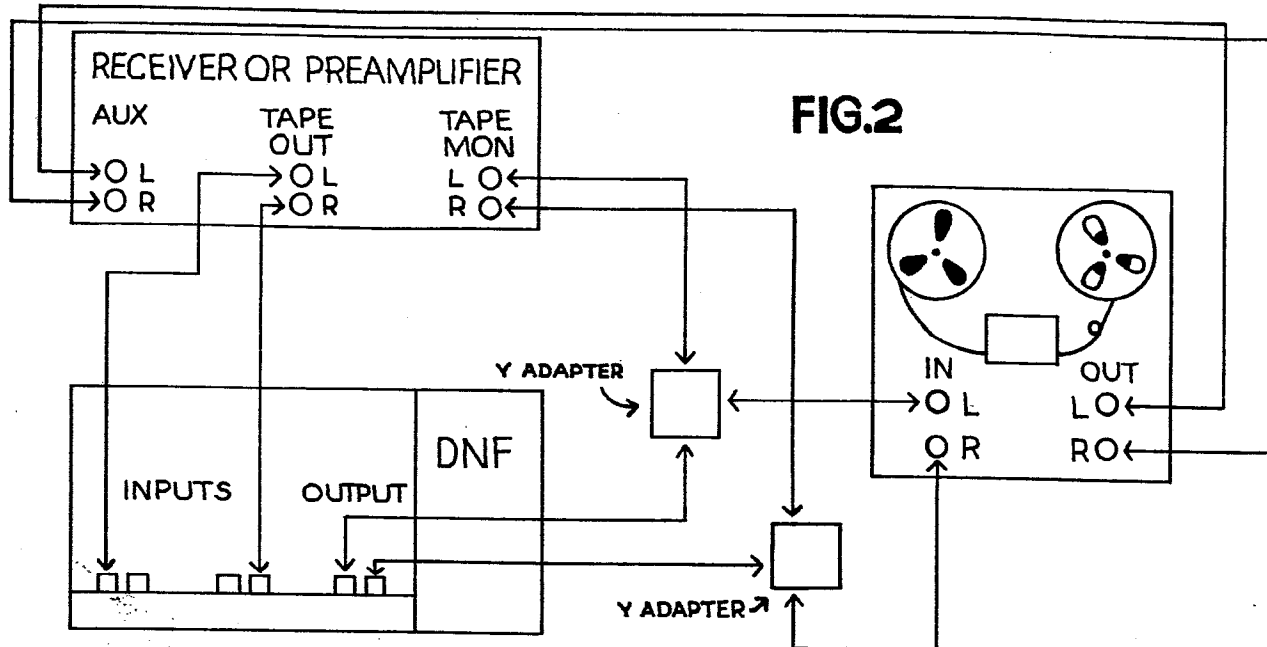


The NORMAL CONNECTION provides -

- 1.) Processing of the source (selected by the PROGRAM SELECTOR) through the DNF.
- 2.) Recording the source directly (not through the DNF) on your tape deck.

You may want to process a program source before recording it on your tape deck. In this case disregard Step 4 of the NORMAL CONNECTION procedure, and substitute the steps on the next page. Refer to Figure 2.

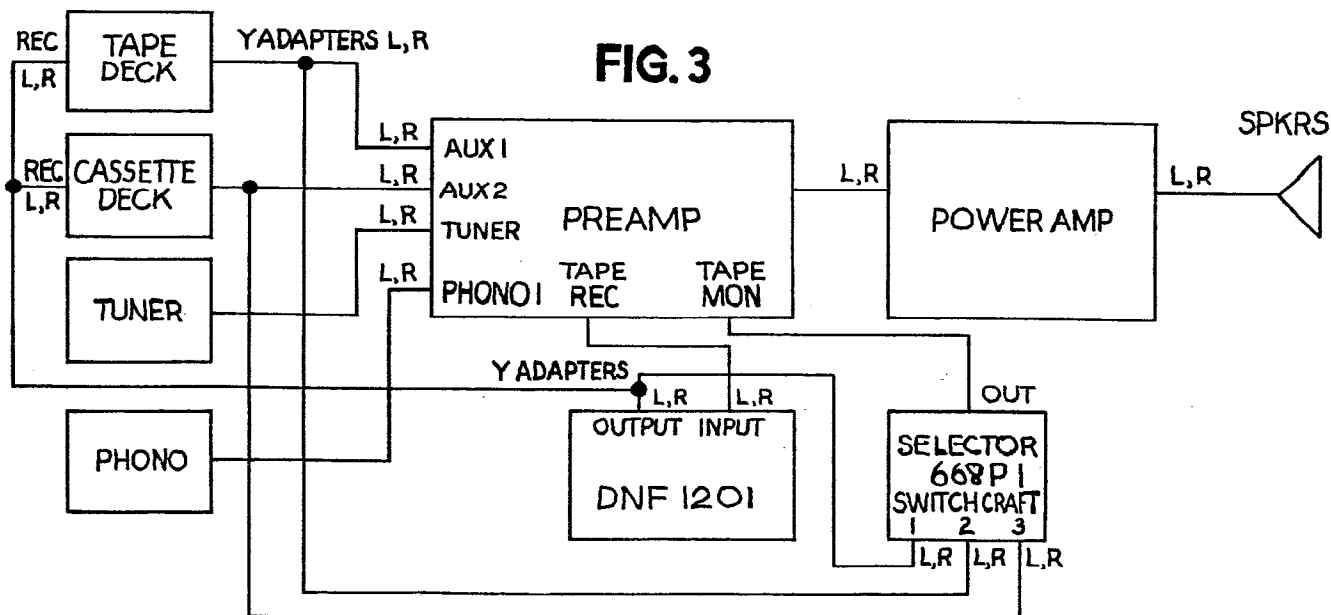
- 1.) Connect the INPUTS of your tape deck, and the TAPE MON INPUTS of your system to the OUTPUTS of the DNF with a pair of Y adapters (Switchcraft 330 FIPI or equivalent).
- 2.) Follow Steps 5 and 6 of the NORMAL CONNECTION procedure.



OPTIONAL CONNECTION (for simultaneous monitoring while recording)

If you require monitoring the output of your tape deck while recording, follow the steps below and refer to Figure 3. You will need several Y adapters and a Switchcraft 668-PI switchbox (or equivalent).

- 1.) Disconnect power from your system.
- 2.) Connect the INPUTS of the DNF to the TAPE OUT jacks of your system.
- 3.) Connect the OUTPUTS of the DNF to both:
  - a. INPUT 1 of the 668-PI switchbox.
  - b. the INPUTS of your tape deck.
- 4.) Connect the OUTPUTS of your tape deck to the following:
  - a. AUXILIARY inputs of your system.
  - b. INPUT 2 of the 668-PI switchbox.
- 5.) Connect the OUTPUTS of the 668-PI switchbox to the TAPE MON inputs of your system.
- 6.) Operate the TAPE MON switch to insert the DNF between the source and the rest of your system.



THE OPTIONAL CONNECTION provides -

- 1.) Processing of the source (selected by the Program Selector) through the DNF before recording.
- 2.) Monitoring the output of the DNF (position 1 on the switchbox).
- 3.) Monitoring the output of the tape deck while recording (position 2 on the switchbox).

## FUNCTIONS

There are four pushbuttons on your Dynamic Noise Filter for optimizing the dynamic noise filter characteristics for various types of source material.

TAPE provides the highest fidelity. Use it for all types of program material, including FM and records, if you have no tick or pop noise problem.

PHONO makes the system less sensitive to ticks on phono records by slowing the attack time of the Bandwidth Controller.

PHONO 78 supplies a still slower attack time and makes the system less sensitive to hiss which would otherwise increase the bandwidth.

OUT sets the bandwidth continuously at maximum, unaffected by the signal. In this position the DNF acts as a unity gain amplifier with flat frequency response.

COMBINATIONS of buttons can be used. Pushing in any button slightly so that all buttons are released will supply a slow attack time together with the widest controller bandwidth. This setting is very useful for piano music. Pushing the PHONO 78 button, together with either PHONO or TAPE provides reduced controller sensitivity to the effects of hiss, simultaneously speeding the attack time.

In all modes, the maximum bandwidth is 30 kc. While the PHONO 78 button may appear to cut the highs relative to TAPE or PHONO it does not actually limit the maximum frequency response. The sensitivity is merely reduced to allow for the higher output of 78 phono cartridges.

## OPERATION

Depress the POWER button on the Dynamic Noise Filter. Press the OUT button and the green bandwidth light will turn on. With this arrangement you should hear a fully accurate reproduction of sound without any noise suppression. This indicates that the Dynamic Noise Filter is correctly wired into your high-fidelity system.

Now select the appropriate mode switch. Use TAPE for all high quality sources. Use PHONO, PHONO 78 or all buttons out only when ticks or crackles are a problem.

Adjust the SENSITIVITY control until the red and green lights, SUPPRESSION and WIDE BAND, flash.

These lights are light-emitting diodes and their flashing is an indication of correct operation and represent the transitional state of noise suppression and bandwidth adjusting circuits. You will now be getting noise reduction without attenuation of high frequencies. You can determine the exact effectiveness of the filter by comparing signals, using the OUT button and the appropriate function or mode button. You can also adjust the sensitivity control more closely with the help of this listening test.

## INPUT LEVEL ADJUSTMENTS

On the rear of your Dynamic Noise Filter you will find a pair of left and right screwdriver adjust type level controls. These are factory adjustments set for unity gain and should not require any attention on your part. If, however, you find that the front-panel sensitivity control needs to be set at the extreme end of its range, either left or right, these controls may require resetting. Adjust so that the sensitivity control is at the approximate center of its range, with the red and green lights flashing. On quiet classical program material, the red light may be on more frequently, whereas loud brassy material may cause the green light to be on most of the time.

## HOW IT WORKS

The Burwen Model 1201 Dynamic Noise Filter is a variable low-pass filter whose cutoff frequency varies between 500 cps and 30 kc in accordance with the needs of the program source. Its attenuation rate is 9 dB/octave. The bandwidth can increase to 30 kc in as little as 400 microseconds so as to accurately follow transient signals. Contraction of the bandwidth takes much longer—in the vicinity of 70 milliseconds. Control of the bandwidth is achieved by measuring the high frequency content of the sum of the left and right inputs from the source material and adjusting the bandwidth in accordance with both level and frequency. The pushbuttons merely change the sensitivity of the bandwidth controller vs frequency and its attack time. In all modes, even PHONO 78, the bandwidth can extend as far as 30 kc at 3 dB down or within .5 dB out to 20 kc.

The DNF 1201 is a suppressor for high frequency noise and has no effect on rumble or low frequency noises. In the OUT mode the DNF acts as a unity gain amplifier.

## WHAT YOU WILL HEAR

The DNF 1201 works on high frequency noise. It is optimized for reducing tape hiss either on tape or recorded on records. It is also effective on the grainy hiss from 78 rpm records and film sound tracks. Noises at middle frequencies are attenuated only slightly however. If a record tick occurs when using the TAPE mode the tick will extend the bandwidth as though it were music. Slowing the attack time by using the PHONO, PHONO 78 buttons, or all buttons out helps to reduce the response to ticks. Nevertheless if a tick occurs while the bandwidth is extended to allow the music to come through the DNF will pass the tick. Your DNF actually provides more noise reduction on program sources which initially have lower noise. This is because the hiss itself extends the bandwidth slightly. On sources having severe hiss the noise can be reduced at a slight sacrifice in high frequencies by lowering the SENSITIVITY control setting. If you hear too much loss of high frequencies, advance the SENSITIVITY control.

Noise reduction occurs only when the bandwidth is reduced. When the bandwidth is extended the noise is actually coming through with the music but you do not notice it due to the masking effect. If the bandwidth is extended too far too often, however, there will be so much noise that the high frequency content of the music is insufficient for masking. In this case you may hear swishing effects and the remedy is to reduce the SENSITIVITY setting by pushing the knob to the left. In severe cases it is generally preferable to accept the slight loss of high frequencies so the variations in noise will become inaudible. Use the tone controls on your other equipment to obtain optimum overall tonal balance following the DNF.

Once the hiss has been reduced substantially music details and possibly imperfections in your record may become more apparent. Since the bandwidth contracts gradually following a tick, extremely hissy records may produce a short burst of hiss following each tick and resulting spitting effect. This can be minimized by using PHONO 78 or all buttons out to reduce the bandwidth attack time. Reducing the SENSITIVITY setting to produce a very slight loss of high frequencies will also help.

## PERFORMANCE MEASUREMENTS

When measuring the frequency response of a Dynamic Noise Filter the results can be confusing because the bandwidth changes with the incoming signal frequency and its level. Accurate measurements can be made only with the OUT buttons pushed to provide a fixed 30 kc bandwidth. In the factory a fixed dc control voltage is substituted for the bandwidth controller output when the narrow band response is being measured.

## CARE OF YOUR DNF

No periodic maintenance is needed beyond occasional dusting. CAUTION—avoid using solvents and cleaning fluids as these may mar the finish.

## SERVICE

Your Dynamic Noise Filter is built to the most rigid control standards possible. Each unit is pretested at the factory prior to shipping. If you experience any difficulty with your Dynamic Noise Filter, return it to your Burwen dealer, as indicated on your warranty card.



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